

# Multiepoch VLA observations of the Einstein ring 1J1830-211

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## ABSTRACT

We present radio observations of the gravitational lens PKS1830-211 at 8.4 and 15 GHz acquired using the Very Large Array. The observations were made over a 13 month period. Significant flux density changes over this period provide strong constraints on the time delay between the two lensed images and suggest a value of 46 $\pm$ 5 days. This offers new direct evidence that this source is indeed a gravitational lens. The lens distance is dependent upon the model chosen, but reasonable limits on the mass of the lensing galaxy suggest that it is unlikely to be at a redshift less than a few tenths, and may well be significantly more distant.

*Subject headings:* cosmology; galaxies: individual (1J1830-211);  
gravitational lensing

## 1. Introduction

The highly symmetrical double structure of the flat-spectrum radio source PKS1830-211 was first identified by Rao & Subrahmanian (1985) who suggested that this unusual combination of properties may be the result of gravitational lensing of a single flat-spectrum source. Further observations (Jauncey et al. 1991) show a low-level ring of emission linking

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